

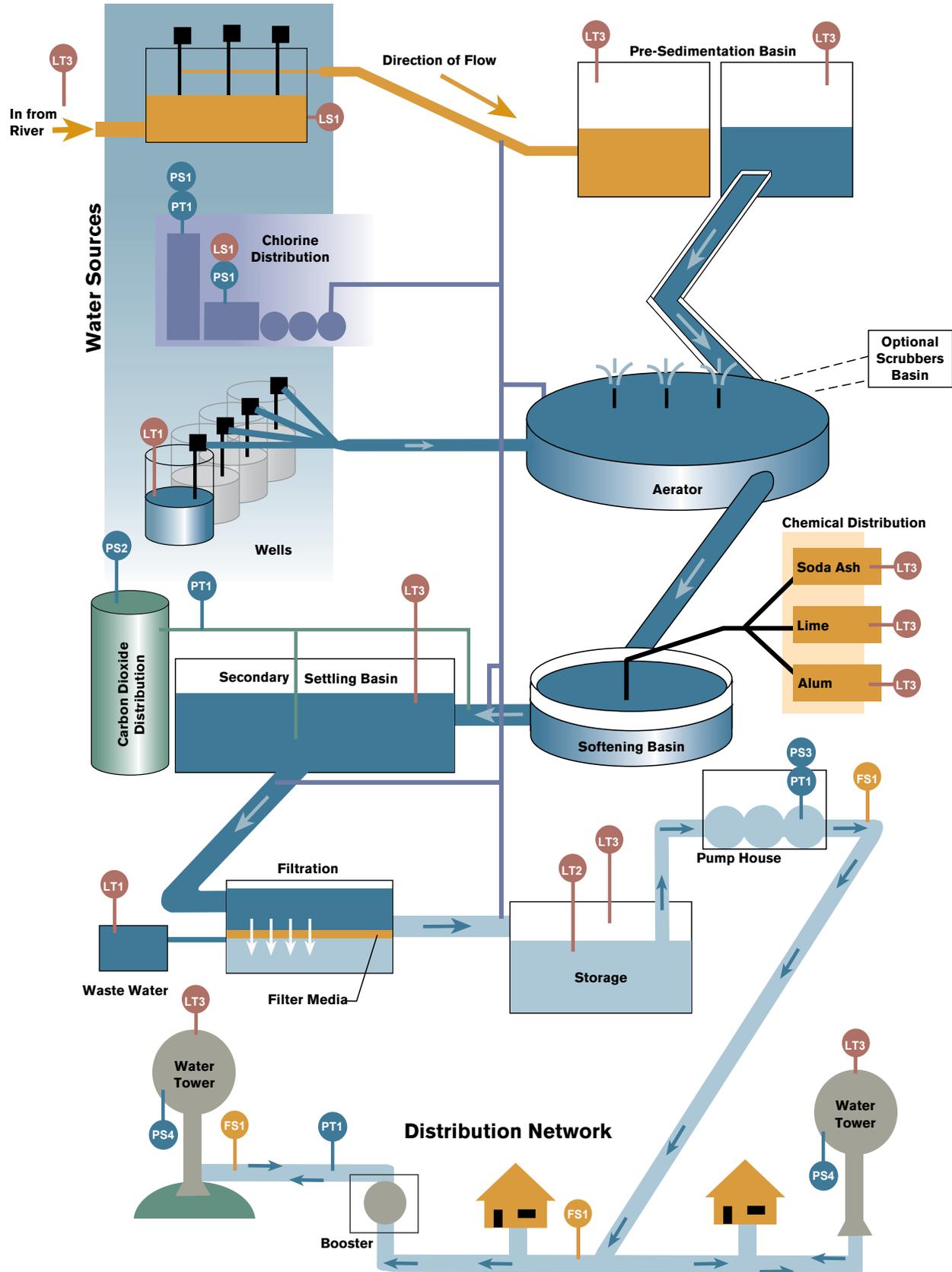


Water Treatment Product Application Notes



Municipal Water Treatment Facilities

Typical Municipal Water Treatment Facility



	FS1	LS1	LS2	LT1	LT2	LT3
Instrumentation	T21 Thermal Differential Switch	Mechanical Level Switch	Single-Point RF Switch	Submersible, Hydrostatic Pressure	RF Transmitter	echOsonix® Ultrasonic Transmitter
Product Features		• Adjustable differential for pump control	• Low Cost • Teflon sensor design	• Fixed range • Nose cone or flush designs • Compact	• Loop powered • Installation flexibility	• Non-contact • Immune to fog and condensate
Water Sources		Low-level switch in sump pit avoids cavitating pumps		Level transmitter monitors well-pumping levels		Level transmitter monitors river/lake levels
Pre-Sedimentation Basic			Scrubber caustic high/low level alarm			Monitor water levels in settling basin
Secondary Settling Basic						Monitor water levels in settling basin
Filtration				Water-level monitor for wastewater tank from filter clearing		Chemical storage for softening basin
Storage	Pump Protection				Water-level monitor for storage tank	Water-level monitor for storage tank
Pump House						
Water Tower						Monitor local water supply in peak hours
Booster Station						

	PS1	PS2	PS3	PS4	PT1
Instrumentation	Explosion Proof (Pressure/Vacuum/Compound)	Weatherproof (Pressure/Vacuum/Compound)	Weatherproof (Pressure/Vacuum/Compound)	Weatherproof (Pressure/Vacuum/Compound)	805PT Pressure Transmitter
Product Features	• FM firesafe design	• Welded diaphragm	• Low cost • Adjustable set point with sealed electrical connections	• Low cost • Adjustable set point with sealed calibrated scale	• Loop powered • 5:1 turndown
Water Sources					
Pre-Sedimentation Basic	Fire-suppression system monitors and scrubber high-pressure alarm				Fire-suppression system monitors
Secondary Settling Basic		High pressure alarm for carbon dioxide distribution			Line-pressure monitor for carbon dioxide distribution
Filtration					
Storage					
Pump House			High-pressure shutdown switch on pump valve		Output pressure transmitter monitors pump performance
Water Tower				High/low level alarm for water tower	
Booster Station					Output pressure transmitter monitors booster performance

This guide presents typical instrumentation for a standard municipal water treatment plant serving 55,000 people and associated industry. Capacity is 16 million gal/day; normal production is 6-10 million gal/day. The plant is gravity fed from pre-sedimentation basin to storage; produced water is pumped directly to consumers.

Water Sources

Surface water, drawn in from rivers and lakes, is generally muddy with a high concentration of suspended solids. Water is drawn into a sump where it is stilled and the large floating solids are settled to the bottom. River (or lake) pumps send the water on to the plant. Ground water, drawn from the water table through wells, is generally much cleaner than surface water and requires less processing.

Pre-sedimentation Basin

In the pre-sedimentation basin the majority of surface water solids are settled out. The basin is divided into two sections. The first section chlorinates the water to kill bacteria, then mixes in alum to bind the solids into large, visible clumps. The basin is continually agitated to promote chemical mixing and clump formation. As water passes over weirs into the second section, ammonia is added to bind the chlorine and form chloramines to disinfect.

In the second section as water passes from one end to the other, solids naturally settle to the bottom. At the far end, cleaned water is drawn over another weir and into the plant.

Aerator

The aerator maximizes contact between the water and air so light volatiles evaporate and the chemical process to remove iron and manganese from the water begins. The aerator is like a large fountain that mixes air and water by splashing over and through several obstructions. Chlorine is introduced here to control algae growth. Mechanical scrubbers may be used in place of the aerator.

Softening Basin

The softening basin removes calcium and manganese by raising the pH level to approximately 10.7, when calcium reverts to a solid it settles to the bottom of the basin. Soda ash reduces carbon content, lime raises the pH level, and alum binds the other chemicals into large clumps that will stay on the bottom of the basin. (While the softening basin requires no instrumentation, the chemical distribution system may use various instruments depending on the manufacturer of the system.)

Secondary Settling Basin

The secondary settling basin lowers the pH back to 9.7, and then stabilizes it at approximately 8.7. Two-stage gaseous recarbonization with carbon dioxide provides the pH drop and stabilization. More solids are also settled out here.

Filtration

Mechanical filters complete the water processing cycle. Large, two chamber basins draw water down through the floor of the upper basin (which contains the filter media) into the lower basin where it is drawn off for storage. The filters are occasionally back-flushed to clean them, and the waste is stored in a waste water tank.

Storage

Finished water is drawn into underground, temporary storage tanks. Consumer water is pumped from here, turning tank inventories frequently during the day.

Distribution Network

This brochure is intended to provide suggestions for the general application of certain types of instruments. Since each application has unique characteristics, it is recommended that you consult SOR® to discuss the specific details of your application to ensure the correct instrument is selected.

Pump House

Finished water from the storage tanks goes directly to the consumer through continuously running pumps.

Water Tower

Water towers serve as accumulators for the system: during low use hours excess water pumped from the plant is stored; during high use hours, water required to meet increased demand is drawn.

Booster Station

To maintain water pressure, boosters may be required for customers at higher elevations or on long pipelines. Boosters generally feed directly into water towers.

